



# SAFETY MANUAL

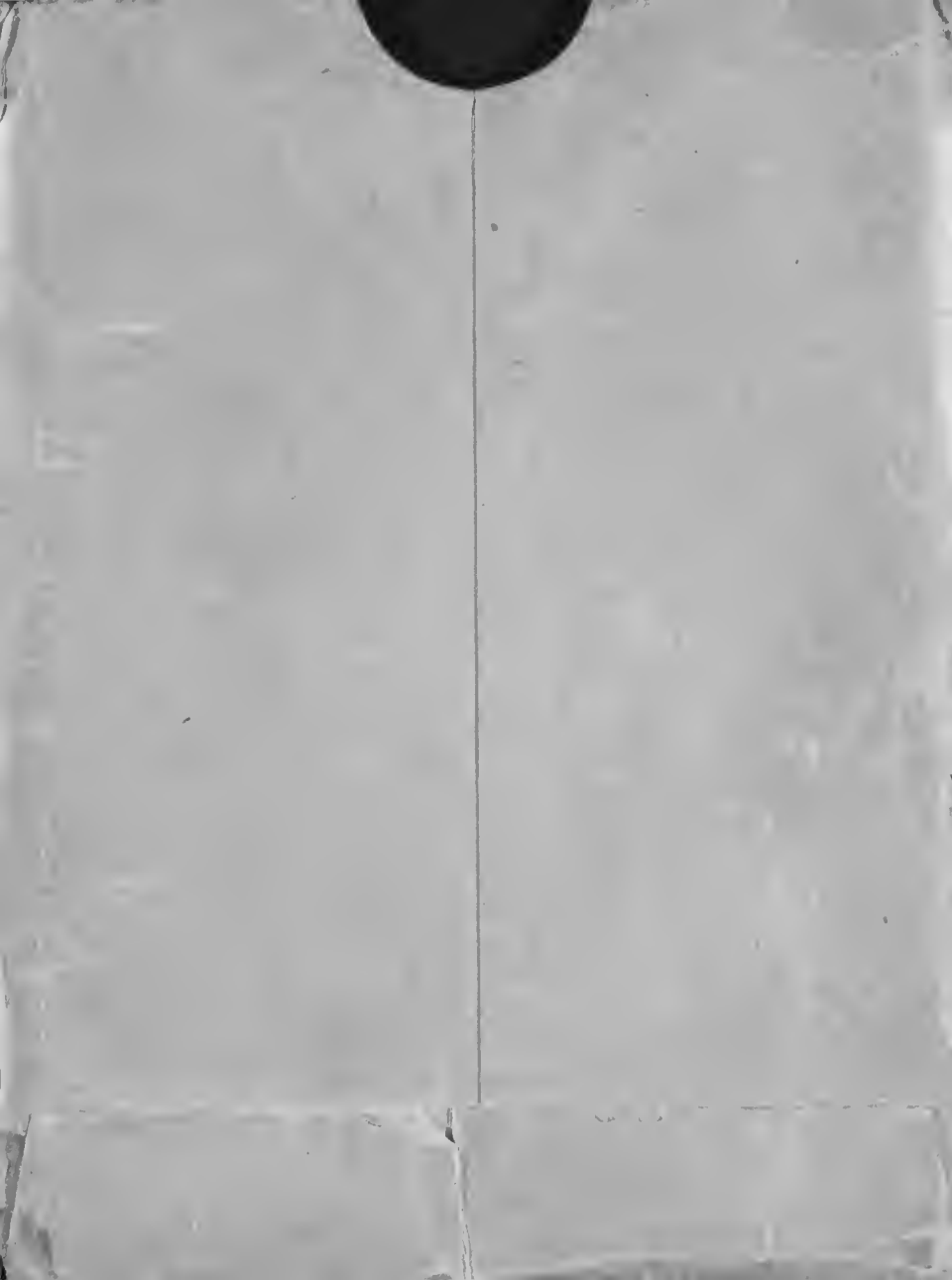
*J. Bond.*



~~*Ch. Jackson*~~

*208.*

CITY OF WINNIPEG  
HYDRO - ELECTRIC SYSTEM





# SAFETY MANUAL



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HYDRO - ELECTRIC SYSTEM







# CITY OF WINNIPEG HYDRO-ELECTRIC SYSTEM



## SAFETY MANUAL

*Effective March 1, 1938*

### TELEPHONE NUMBERS:

DOCTORS' REGISTRY	/	/	57 181
POLICE AMBULANCE	/	/	105
HYDRO TROUBLE	/		848 121 & 22





542

This Manual No. .... is loaned to .....

*W. J. J. J. J.*

so that he may become familiar with the rules contained herein. It is especially important

that he make a careful study of the rules in sections .....

*B. C. D.*

.....  
(Fill in parts pertaining to employee's work)

*P. H. J. J. J.*

Superintendent



## SAFETY MANUAL

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# SAFETY MANUAL

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## PURPOSE

The safety rules herein are for strict observance by all employees of the City of Winnipeg Hydro - Electric System. They are intended as general guides to safe practice—they do not cover in detail all safety measures which can and must be observed by employees in their work. They do not replace any verbal, written, or other instructions which have been issued regarding safe and proper procedures.

Each employee to whom this manual is issued is expected to know the general rules, and also the special rules applying to any department in which he may be working. The manual shall be kept available for ready reference. Should it be lost, the superintendent must be notified at once.

Employees are invited to suggest, through their superintendents, any improvements which might be made to these regulations.

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Because most accidents which have occurred could easily have been avoided, it is worthy of much emphasis that the best protection against them is observant and thoughtful carefulness. To be safe you must keep your mind on the job at hand—to be thinking of something else is often to invite injury to yourself or to others. On no work are you expected to be in such haste as to neglect safety.

If working instructions are indefinite, if their meaning is doubtful, if they have been forgotten in any detail, then by all means ask to have them repeated, rather than to even consider "taking a chance."





## DEFINITIONS

For the purpose of these rules, the following definitions of terms used will govern:

### Electrical Transmission Circuit:

Any electrical line energized to a pressure normally 5,000 volts or more between conductors.

### Electrical Distribution Circuit:

Any electrical line energized to a pressure normally less than 5,000 volts between conductors.

### High Voltage Conductor:

Any electrical conductor normally energized to a pressure of 300 volts or more.

### Clearance:

A term which is used for permission to undertake work upon equipment or electrical circuits.

### Hold:

A term which is applied to equipment which signifies that no change is to be made except by direct permission of the person to whom the hold is granted. Normally a "hold" card is the evidence that clearance has been granted to undertake work.

### All Clear:

A term which is used to cancel a clearance. It is also used in reporting that normal or safe conditions exist.

### Caution Card:

A warning card placed at the switchboard controller of a circuit or of apparatus which is in operation, signifying that men are working thereon.





## PENALTIES

- (a) Failure to enforce these regulations will render a foreman liable to reduction or dismissal at the discretion of the management.
- (b) Neglecting to use Rubber Gloves, other safety apparatus and appliances provided, or showing carelessness when working with high voltage conductors will render an employee liable to suspension for the first offence, dismissal for the second offence.
- (c) Any employee will be liable to suspension or dismissal who:
  - (1) Reports for work under the influence of intoxicating liquor or drugs, or
  - (2) Knowingly works with another employee who is under the influence of intoxicating liquor or drugs, or
  - (3) Turns over a shift to another employee who is under the influence of intoxicating liquor or drugs.
- (d) Gross carelessness in respects other than the above will render an employee liable to suspension or dismissal.



## SECTION A

### GENERAL RULES FOR FOREMEN

#### 1. RESPONSIBILITY.

- (a) Foremen shall be thoroughly familiar with Safety, Working and First Aid Rules.
- (b) Foremen shall not allow men to start or to continue to work who apparently are not in proper physical condition either to work or to work safely.
- (c) Foremen shall be responsible for—
  - (1) The enforcement of these regulations.
  - (2) The execution of work in a safe manner, and for the safety of all employees working under their direction.
  - (3) Protecting the public from injury during the course of work performed by their men.
  - (4) The supply of safety equipment to their men, and for its proper use.
  - (5) Maintaining safety equipment in proper condition at all times.
  - (6) Making frequent and regular inspections to insure the proper condition of safety equipment.
  - (7) Having rubber gloves turned in for test at regular intervals.
  - (8) Explaining the hazards in detail to men who are to handle any high voltage conductors.
  - (9) Making sure that each one of their men understands which conductors or equipment are known to be alive.



## 1. RESPONSIBILITY (continued)

### (c) Foremen shall be responsible for—

- (10) Instructing the substation operator to place a "Caution" card upon the feeder panel or panels concerned when, due to the presence of high voltage conductors, men are performing work which requires extra precautions. When in doubt, call for a "Caution" card.
- (11) Immediately telephoning the substation operator definite instructions as regards holding off or reclosing a feeder which bears a "Caution" card in the substation, and which has been tripped out accidentally.
- (12) Having the substation operator telephoned, when the crew is all clear, that a "Caution" card is to be removed.
- (13) Explaining to men in detail, the handling and proper methods of operation of tools and equipment, also the hazards of wrong application.
- (14) Inspecting first aid cabinets and kits at frequent intervals and seeing that they are kept fully supplied with the proper contents.
- (15) Seeing that men receive first aid treatment in case of injury.
- (16) Reporting all accidents which may occur to their men.
- (17) Obtaining an ambulance or doctor when necessary.



## SECTION B

### GENERAL RULES

Applicable to all employees

#### 2. ATTITUDE OF EMPLOYEES.

- (a) Every precaution shall be taken to guard against accidents of all kinds to others or to self.
- (b) Every defective or dangerous condition which comes to the attention of any employee shall be reported.
- (c) So called "practical" jokes, horse play, scuffling and wrestling while on duty are prohibited. The outcome of these is too often serious.
- (d) The following are considered to be the duties of employees:
  - (1) To continually watch fellow employees and others, and immediately call attention to any unsafe practice observed.
  - (2) To receive instruction in the prone pressure method of resuscitation from electrical shock, and to practice this method at frequent intervals under the direction of the foreman or a competent instructor.
  - (3) To guard the public from danger until relieved, when a public hazard caused by public utility equipment (such as fallen wire) is encountered.

#### 3. SAFETY EQUIPMENT OTHER THAN RUBBER GLOVES.

- (a) Safety equipment which is provided must be used on every occasion when properly required.
- (b) The wearing of safety boots by all construction and maintenance employees is strongly recommended.





### 3. SAFETY EQUIPMENT OTHER THAN RUBBER GLOVES (continued)

- (c) Body and pole belts must be kept oiled and soft. They must be examined at frequent intervals; a damaged or defective belt must be reported to the foreman or superintendent at once, and if necessary changed for a new belt.
- (d) Goggles shall be kept available by foremen, for the use of their men when required.
- (e) Goggles shall be worn—
  - (1) When using emery wheels or chipping hammers.
  - (2) When chipping steel, cement, stone, brick, tile or other hard material.
  - (3) When doing any work during which foreign particles might be lodged in the eyes.
- (f) Colored goggles or screens shall be worn—
  - (1) When using welding or metallizing equipment.
  - (2) When looking into furnace interiors.

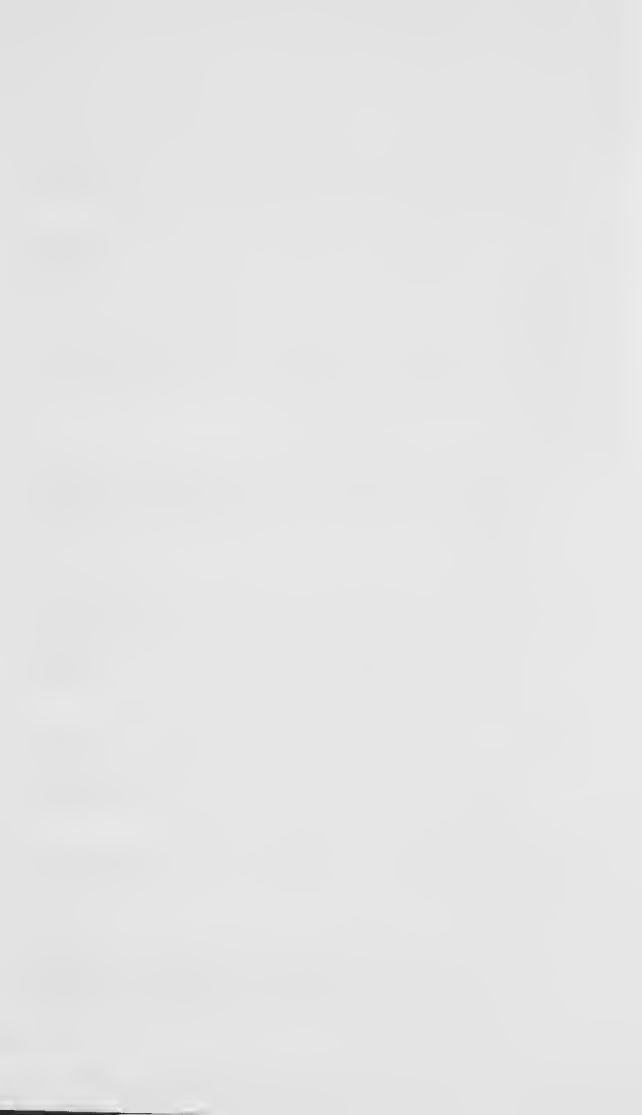
#### *Use Goggles—You Cannot See Through Glass Eyes*

- (g) Each employee shall make sure that he knows the location and proper use of all fire extinguishers, gas masks and first aid equipment in the place where he is working.
- (h) When trucks leave line gangs, sufficient rubber goods and other safety appliances must be left with the men for emergency use.



#### 4. SAFETY EQUIPMENT—RUBBER GLOVES.

- (a) Rubber gloves and leather protectors are supplied by the department as necessary safety equipment for electrical work. They must be turned back regularly for inspection and test.
- (b) Leather protectors must be worn over rubber gloves in every case where the work performed might result in damage to the gloves.
- (c) Before the first use of rubber gloves each day, the wearer shall visually inspect them, also test them with the recognized air pressure test.
- (d) Rubber gloves must be worn:
  - (1) When working on or when reaching over or near high voltage wires, conductors or apparatus. On voltages less than 300 other adequate methods of insulation may be substituted.
  - (2) When working on series arc or incandescent lamp circuits, except after the circuits are properly grounded at the point where the work is being done, or when the circuits are opened up on both sides close to the location where the work is being done.
  - (3) When placing or removing grounding and short circuiting chains or wires on lines which are nominally dead. Remember that induction from or crosses with other circuits may exist.
  - (4) When pulling or replacing primary fuses of transformers or fuses in high voltage circuits.
  - (5) When insulated live conductors of over 300 volts must be handled. The reason: whereas rubber gloves are tested regularly, the conductor insulation cannot be tested in a satisfactory manner.



#### 4. SAFETY EQ'PT—RUBBER GLOVES (continued)

(d) Rubber gloves must be worn:

- (6) When stringing or pulling out wires that are over or under high voltage conductors, or when stringing or pulling wires which in any way might become crossed with high voltage conductors.
  - (7) When opening common neutrals, bearing in mind that open neutrals are to be treated the same as primaries or high voltage conductors.
  - (8) When operating transmission circuit disconnecting switches.
  - (9) When making any repairs to any open wire transmission telephone line, or to any apparatus connected thereto unless the apparatus is entirely isolated from the telephone line.
- (e) When performing work under conditions not covered by the preceding, each employee is expected to use rubber gloves for every condition where their use will render him more safe.
- (f) Before coming within reaching distance of live conductors or parts, rubber gloves shall be put on and left on until work is completed and the wearer is at a safe distance.
- (g) Sleeves must be kept down, and the rest of the body kept positively clear of all wires and grounds, whenever rubber gloves are used.
- (h) Damaged or worn rubber gloves must not be used, they must be turned in to the foreman to be replaced.
- (i) The foreman on receiving a pair of defective rubber gloves for replacement, shall retain them out of service and turn them in to the superintendent at first opportunity.
- (j) Even when wearing rubber gloves, remember always that good judgment and forethought must be used—keep your mind on your work and the possible danger that may be associated with it.



## 5. FIRE PROTECTION EQUIPMENT & GAS MASKS.

- (a)  $\text{CO}_2$  or carbon dioxide gas (not to be confused with carbon monoxide) is not poisonous but is suffocating, since in a confined space it displaces the air, including the oxygen content. Carbon dioxide is heavier than air, hence after discharge the greatest concentration may be found near the floor.
- (b) When Lux,  $\text{CO}_2$ , or carbon dioxide fire protection equipment discharges the following shall be observed:
  - (1) All persons shall immediately leave the space in which the gas is discharging, being careful to close all doors and other openings in order to prevent escape of the gas while fire is being smothered.
  - (2) Do not re-enter the space filled with gas without great caution. If it is necessary to re-enter before it has been thoroughly ventilated, this can be done for a short period by holding the breath, or for a longer period by using a hose type gas mask or oxygen supply breathing apparatus. Do not use a canister type mask unless the air has been tested to contain sufficient oxygen.
  - (3) After fire protection equipment has discharged, a Davey type safety lamp may be used to test the oxygen content of the air. If the lamp will burn, there is sufficient oxygen present to support life and to allow the use of a canister type mask. Note particularly that even if the safety lamp burns, there may still be dangerous gases present.
  - (4) Do not use an open flame on re-entering. There may be explosive gases present.
  - (5) Should a person be overcome by gas he should be rescued immediately, given plenty of fresh air, and if necessary, artificial respiration applied by the prone pressure method.





## 5. FIRE PROTECTION EQUIPMENT & GAS MASKS (continued)

- (c) The poisonous but slow acting phosgene gas which may be formed when pyrene is sprayed upon very hot fires or metal surfaces should be kept in mind as being dangerous.
- (d) Note particularly that canister type masks may be used only in places where there is enough oxygen in the atmosphere to support life.

## 6. PREVENTION OF FIRES AND EXPLOSIONS.

- (a) Oily rags shall be kept in covered metal containers.
- (b) Open containers holding gasoline or other inflammable liquids must not be left around after use is completed.
- (c) Gasoline and kerosene cans shall be of the safety type. Gasoline cans shall be painted red.
- (d) Smoking is prohibited near spray painting equipment which is in operation.
- (e) Special precautions shall be taken to avoid causing sparks or allowing naked flames or the striking of matches in locations where an explosion might be caused. Examples are locations where the air may contain:
  - (1) Gasoline fumes.
  - (2) Transformer oil fumes such as may be near transformer tanks or oil storage tanks.
  - (3) Coal dust.
- (f) Approved "spark" or "gas" lighters, not matches or cigarette lighters, shall be used to ignite acetylene torches.



## 7. TOOLS AND EQUIPMENT.

- (a) At least once each month, each superintendent shall inspect or shall have inspected, all tools used in his department. Any tools which are found to be unsafe or in improper working condition shall be repaired or replaced before further use.
- (b) Tools such as chisels, hammers, drifts, drills and wedges shall not be used after the heads have been mushroomed unless they have first been redressed.
- (c) Hammers, axes, picks, sledges or similar tools shall not be used when the handles are loose or split.

## 8. ROOFS, SCAFFOLDS, STRUCTURES.

- (a) When climbing or working on an inclined roof, a man shall have an attendant nearby in event of an emergency.
- (b) Scaffolds shall be substantially braced and built with sound material. They shall be capable of sustaining a load of at least three times the weight of men and materials which may be placed upon them. All planking for scaffolds shall be securely fastened. On elevated scaffolds, railings or rope guards shall be provided.
- (c) Tools, pulley blocks, apparatus or materials must not be thrown down from towers, platforms, scaffolds, poles, or ladders. They must be lowered by means of a handline.



## 9. LADDERS.

- (a) The use of weakened or otherwise defective ladders is forbidden.
- (b) Securely place a ladder before climbing it. Ordinarily, the foot of the ladder should be about one quarter of its length out from the wall—for example, the foot of a 20-foot ladder should be about 5 feet out from the wall. If there is any possibility of the ladder slipping, then adequate means must be used to prevent such an occurrence.
- (c) No wires shall be left attached along the vertical members of ladders.
- (d) Safety feet shall be installed on all ladders used inside stations and on all ladders used outside on concrete and other hard or slippery surfaces.
- (e) When a man is working on a ladder, it shall be held by an attendant or securely tied in place.
- (f) Step ladders shall be fully opened while being used.

## 10. CRANES, LIFTS, HOISTS, ROPES.

- (a) Care must be taken not to exceed the safe load of chain lifts, hoists, ropes, etc., and to firmly secure loads against slippage.
- (b) Men must not work or walk under material or machinery that is being handled by cranes, chain blocks, or other hoisting equipment.
- (c) Manila rope should be stored in a cool and not too dry atmosphere.
- (d) Rope must never be strained over sharp corners or small bends, because of damage to the fibre or strands which in turn may result in breakage.



## 11. MANHOLES, HOLES, TRENCHES, OBSTRUCTIONS.

- (a) When a manhole cover is to be removed, the guard shall first be erected toward the oncoming traffic, then the cover placed on the far side of the hole. A cover shall be replaced before leaving unless the hole is properly guarded, marked with danger signs, and lighted at night.
- (b) Holes, trenches, and obstructions in the streets must be protected by suitable guards and danger signs, and lighted at night with one or more red lanterns visible from all sides of approach, all to be in complete conformity with local regulations.
- (c) Adequate shoring shall be installed in trenches or excavations where the depth of excavation, the structure of the soil, or adjacent objects might make cave-ins possible.

## 2. WORKING METHODS.

- (a) If an employee is in doubt as to the proper performance of any work to which he has been assigned, he should ask for instruction from the foreman or other responsible person.
- (b) Severe injury may result from lifting heavy weights when in an awkward position. Mechanical devices must be used when possible.
- (c) Gloves must be worn in handling creosoted materials to prevent skin irritations.
- (d) Solder must be dried, and ladles must be heated before being placed in a hot pot.





## 12. WORKING METHODS (continued)

- (e) In working with cement, care must be taken to keep the skin clean and protected by clothing as much as possible. Cement dries out the natural oils, which causes cracking of the skin, leaving it open to infection. If necessary, "Ply" ointment as supplied shall be used for protection from cement burns.
- (f) To dilute acid, it must be poured into the water slowly and with great caution. Never pour the water into the acid.

## 3. HOUSEKEEPING.

- (a) Any oil, grease, or other damp or slippery material spilled on steps or floors must be cleaned up at once in a thorough manner.
- (b) Tools and materials must not be left lying on floors, stairs or on scaffolds where there is the hazard of tripping over them.
- (c) Tools, equipment and loose materials shall not be left lying around floors and yards, but must be kept in proper locations, gathered up, and when possible neatly piled.

## 4. INJURIES.

- (a) Treat all cuts and open wounds by first aid methods at once.
- (b) Immediately report all injuries, no matter how trivial.



## 15. CLEARANCES.

- (a) When equipment is "held" in order to work upon it, it must first be made as safe as possible by the person normally in charge, who must then give his clearance to the man in charge of the special work to be done.
- (b) Consider as being in operation, all circuits, cables, wires, connections and apparatus, except when a clearance has been obtained.

## 16. WORK ON OR NEAR ELECTRICAL EQUIPMENT.

- (a) Consider as being alive, all circuits, cables, wires, connections and apparatus, unless determined otherwise.
- (b) Before any work is done on or near electrical apparatus, high voltage conductors or connections upon which clearance has been obtained, men are required to determine whether the apparatus, conductors or connections are dead. This should be done by test, if possible.
- (c) Work which must necessarily be done on or near high voltage exposed conductors or rotating machines must be done so as to eliminate all possible risks with respect to shock or other injury.
- (d) Work must not be done near high voltage conductors which can be done with greater safety elsewhere.
- (e) When working on an oil circuit breaker, the D.C. control switch to that breaker shall be kept open except when required to be closed for testing the mechanism or connections.
- (f) In testing low voltage wires to determine whether they are alive, the fingers must not be used. Use a lamp or other testing device.



## 16. WORK ON OR NEAR ELECTRICAL EQUIPMENT (continued)

- (g) Employees not familiar with the dangers in connection with electrical equipment or lines upon which they are to work shall proceed with such work only when accompanied or directed by a properly qualified and authorized individual whose instructions must be rigidly obeyed.
- (h) Metal rules, steel tapes and tapes containing metallic material must not be used near any energized electrical conductors or connections.
- (i) A damp manila rope is a partial conductor of electricity and must be treated as such.
- (j) The carrying of tools, pipes, or other apparatus near high voltage conductors, without taking all precautions to prevent contact with charged conductors, is forbidden.

## 17. SWITCHING.

- (a) All verbal orders involving switching must be repeated back by the employee receiving same.



## SECTION C

### TRANSMISSION CIRCUITS

#### 18. CLEARANCES.

- (a) No person shall commence any work on any electrical transmission circuit until he has obtained a clearance from both ends, and is certain that the circuit is dead, with disconnects open and the line grounded at both ends.
- (b) If a conductor is on the ground, under no circumstances may it be touched until clearance has been obtained with the circuit dead and grounded.

#### 19. GROUNDING.

- (a) Invariably the first act in proceeding with work on a transmission circuit shall be to ground the conductors at the point where the work is being done. If a conductor is to be parted or has become parted, then it shall first be grounded on each side of the open point.

#### 20. WORKING METHODS.

- (a) In climbing steel structures, every precaution shall be taken to make sure that each structural member is secure before placing any reliance upon it. Men must continually be on the watch for loose nuts and bolts and must at once tighten any which are found to be loose.
- (b) When climbing any structure or tower supporting double circuit lines, men are required to hesitate for a period of at least ten seconds just below the lower crossarm, to assure themselves which circuit is the correct one to approach and to take notice of any signs showing the names of the circuits. This hesitation rule must also be applied when shifting position on the structure or tower top.





## 1. SAFETY EQUIPMENT.

- (a) Safety belts must be used whenever possible, even when doing the smallest item of work on a tower, structure or pole.
- (b) Rubber gloves must be used for any work on telephone circuits which parallel electrical conductors over any of their course, until the telephone line conductors are grounded at the point where the work is being done, or until the equipment being worked on has been entirely isolated.



## SECTION D

### STATIONS AND SUBSTATIONS

#### 22. CLEARANCES AND HOLD CARDS.

- (a) Clearance for work on electrical apparatus or circuits shall not be given:
  - (1) Unless disconnect switches as well as oil circuit breakers in all sources of feed are open.
  - (2) Unless all possible sources of backfeed, such as through potential transformers, have been opened by pulling fuses, etc.
  - (3) Until hold cards have been issued by the operator in charge, and placed on all proper locations.
- (b) The man in whose name the clearance is obtained must verify that hold cards have been correctly placed to afford protection.
- (c) Hold cards shall bear the name of the man in charge of the work, and shall contain a written description of the work to be done.
- (d) Separate hold cards shall be used for gangs of men working in different locations and not under the visible charge of one man.
- (e) Clearances shall be given over the telephone only in case of interstation or outside line or cable work.
- (f) "Held" apparatus or circuits shall not be released or cleared for return to service until the hold cards bear the signature of the man whose name appears on the card, except when it is necessary to use the telephone for interstation or outside line or cable work. In all cases the man whose name appears on the card must also definitely state that he and all men working with him are all clear of the apparatus or circuits.



### 23. CAUTION CARDS.

- (a) The time of placing and of removing each caution card on a distribution feeder switching panel, and the name of the foreman requiring the caution card, shall be entered on the substation daily log sheet.
- (b) Should a distribution feeder carrying a caution card be tripped out by a short circuit, it shall be held off for ten minutes and then reclosed. If before the ten minutes have elapsed, definite instructions are received from the foreman of the men working on the feeder to reclose or to hold off the feeder, such instructions shall be rigidly followed.

### 24. DISCONNECT SWITCHES.

- (a) Rubber gloves must be worn when using disconnect sticks to pull disconnect switches.
- (b) Before pulling disconnect switches, employees must make absolutely certain that they are not under load.
- (c) When the hook of the disconnect stick is in position, hesitate long enough to re-check that the proper disconnect is being pulled.
- (d) Open or close a disconnect switch with a single quick motion, and not in a hesitating manner.
- (e) If available in the station, a second man must check the correctness of the circuit and watch the pulling of single pole disconnect switches.

### 25. WORK ON OR NEAR ELECTRICAL EQUIPMENT.

- (a) When a clearance has been obtained on electrical apparatus, men are required to determine for themselves (by test if possible) whether the apparatus, conductors or connections are dead.



## 5. WORK ON OR NEAR ELECTRICAL EQUIPMENT (continued)

- (b) Before touching high voltage conductors and apparatus on which a clearance has been obtained (particularly lightning arresters, lead covered cables, and static condensers), all phases or units must be discharged to ground by a metallic connection first connected at the ground end, and proceeding as if a high voltage conductor were being manipulated. It is equally important to discharge static condensers between phase terminals. Low voltage static condensers must also be discharged between phase terminals and between phase terminals and ground.
- (c) When men must work near high voltage conductors or rotating machinery, the foreman shall be responsible for seeing that danger signs are posted and, if necessary, guards erected.

## 6. PREVENTION OF FIRES AND EXPLOSIONS.

- (a) No smoking is permitted in storage battery rooms. No matches shall be lit, electric sparks caused, or open flames brought into a storage battery room while the cells are gassing, or when the cells are not gassing until the room has been opened up and well ventilated.
- (b) Inflammable material, particularly old packing boxes, excelsior, or oily rags, must not be left lying around stations or substations.
- (c) Oil which has been thrown from circuit breaker, regulator or transformer tanks must be cleaned up as soon as possible, and great care exercised that it does not become ignited before it has been removed.

## 7. PROTECTING THE PUBLIC.

- (a) Operators must not allow visitors around except when accompanied by one or more employees familiar with the station and its equipment.





## SECTION E

### ELECTRIC DISTRIBUTION LINES, SERIES ARC AND INCANDESCENT LAMP CIRCUITS

#### 28. QUALIFICATIONS.

- (a) Men not qualified by experience shall not be permitted to work on or about lines or line equipment except under the direct supervision of an experienced individual.

#### 29. SAFETY EQUIPMENT.

- (a) All linemen are expected to know when, where, and how to use safety equipment such as rubber shields, insulator hoods, line hose, etc., without being told by the foreman. These must be used where needed.
- (b) Any live wires crossing below wires which are being removed must be covered with tubes and pigs.
- (c) Linemen shall use safety belts at all times when engaged in handling wires or apparatus on any pole or structure, except when changing position.
- (d) Before starting work on a pole and before releasing his hold, the lineman must test his safety belt by throwing his weight against the strap in order to make sure that the snap is properly caught.
- (e) When attaching his safety belt the lineman should if possible place himself in such a position that if he falls due to electric shock or slipping, he will swing clear of live wires.
- (f) Rubber goods should not be put away wet except when unable to do otherwise. If they have been put away wet, they must be taken out and dried on first opportunity.
- (g) Never carry rubber goods in compartments on the trucks, or in pockets with tools or other equipment.



## 29. SAFETY EQUIPMENT (continued)

- (h) Canvas bags are supplied for the protection of rubber gloves; in order to have the gloves available at all times each lineman shall carry the bag snapped to his belt.

## 30. WORKING METHODS.

- (a) A lineman must not start to climb a pole or structure until the man ahead is located and has his safety belt properly fastened.
- (b) Both hands shall be kept free while climbing; only tools and material for which the belt is designed, and the end of the hand line, may be carried up or down. Other material must be raised or lowered by means of the hand line.
- (c) A canvas tool bag shall be used for tools and small material when raising or lowering these items to or from poles or structures.
- (d) Hand lines must be kept in first class condition. They must be kept clean of sharp particles of solder or other slivers or particles which might puncture rubber gloves.
- (e) Work from above or from the side while soldering, in order to prevent burns.
- (f) Watch each pole for loose pole steps, braces or guys, or for any such equipment which might be in contact with live wires. Any equipment so found must be cleared up before proceeding with the work.
- (g) In replacing an old pole, it should be tested for decay. If the pole is not considered strong enough to sustain the lineman's weight, it shall be securely piked or guyed before the work is commenced. If the pole is being replaced by a new pole, it must be securely lashed to the new pole before wires are transferred.



**30. WORKING METHODS (continued)**

- (h) When possible, avoid reaching across, over or under live wires.
- (i) When pulling in wires parallel to or across other live circuits, hand lines shall always be attached to the pulling end of the wires; the groundman tending the payout reel must wear rubber gloves, and no person shall allow any part of his body to come in contact with the wires being strung.
- (j) The lineman must not trust his weight to span wires, guy wires, pins, braces, or brackets.
- (k) Before pulling cutouts, the lineman shall properly secure himself to the pole or structure with his safety belt, and he must put on rubber gloves.
- (l) A lighted furnace must never be put in the truck unless it is watched constantly. Proper ventilation must be provided in the truck.

**31. HANDLING WIRES AND CONNECTED APPARATUS.**

- (a) Series arc circuits and series incandescent lamp circuits must be considered at all times as if energized with at least 2,400 volts.
- (b) Open neutrals are to be treated the same as primaries or as high voltage conductors.
- (c) The weatherproofing of a wire must not be relied upon for protection against shock.
- (d) Except after using all safeguards and taking thorough precautions against injury from shock, the following are not permitted on primary or series lamp circuits which are or which might be energized.
  - (1) Removing grounds or crosses.
  - (2) Handling or working with connected apparatus.
  - (3) Trimming or cleaning appliances, including lamps.



### 32. TRANSFORMERS.

- (a) The cases of connected transformers, when not grounded, shall be treated the same as live conductors; the cases of grounded transformers shall be treated as grounded conductors.
- (b) Distribution transformers shall not be used to stand upon or as a platform.
- (c) Every boosting or bucking transformer must have a red band six inches wide painted around it. The primary winding must not be fused by itself, but a primary oil cutout shall be installed on the substation side of all connections to the transformer.

### 33. TOOLS AND EQUIPMENT.

- (a) The use of defective or unsafe climbers is not permitted. Climbers with gaffs worn short are not permitted. Gaffs shall be kept sharp, and properly set by means of an angle gauge. The climbers shall fit properly.
- (b) Tools and long, heavy equipment not in use momentarily should be laid flat on the ground and not stood against poles, fences, or buildings. Tools or equipment which have served their purpose should be returned to the compartments on the truck and not left lying on the ground.
- (c) Never leave tools or materials lying on cross-arms or stuck into poles.
- (d) Tape the handles of pliers and other similar tool grips to lessen the likelihood of dropping them.
- (e) Pike poles must be kept free from cracks or slivers.





### 34. CLOTHING, ETC.

- (a) The wearing of shirts, trousers, slipovers, overalls or other apparel with "Zipper" fasteners, for work on overhead equipment or near any electrical equipment, is forbidden.
- (b) Men are advised against wearing finger rings while at work—they are a hazard to the wearer. Any accident resulting from wearing a ring will be considered a case of negligence on the part of the employee.

### 35. TRIMMING TREES.

- (a) When trimming trees use ladder or crow's nest truck and the proper tools. If necessary to climb, climbers should be equipped with special gaffs.
- (b) Never allow limbs to fall on wires; never touch limbs that are in contact with wires with the bare hands.

### 36. PROTECTING THE PUBLIC.

- (a) Every precaution must be taken to protect the public and property. In the case of any obstruction on the street, danger signs must be displayed. Extra care must be used to keep groundmen and the public clear and at a safe distance when linemen are raising or lowering hot solder or using it up a pole.
- (b) Wires being removed or strung must not be allowed to sag in any way which will endanger the public.
- (c) Construction materials which must be placed in a public thoroughfare must be located so as to interfere as little as possible with traffic.



## SECTION F

### ELECTRIC DISTRIBUTION—UNDERGROUND

#### 37. WORKING METHODS.

- (a) Continually watch for the presence of fumes and gas in manholes, because of the danger of setting them on fire and because of the danger of asphyxiation. Before entering a manhole, examination must be made in this respect.
- (b) No man shall work in a manhole unless an attendant is on top to see that the hole is kept clear, and to watch for the safety of the man below and for the safety of the public. If for any reason the man on top has to leave the hole, he will notify the one working below, who will then come up on top and stay there until his helper returns, or another man takes his place.
- (c) Before breaking down a cable, a jointer shall first make sure that he is on the proper cable by referring to the tagging thereon; he shall then drive an insulated screwdriver into the core of the cable.



## SECTION G

### STEAM PLANTS

#### 38. RESPONSIBILITY.

- (a) Responsibility for the safety of men working inside boilers shall rest with the shift engineer.
- (b) The proper maintenance of guards, railings, toe boards, ladders, tools, and other like equipment shall be the responsibility of the foreman.
- (c) No valves shall be opened or closed, or any machines started up without orders from the foreman or shift engineer, except in the regular routine of duty.
- (d) All valves and glands must be examined periodically by the shift engineer. Any employee who observes a leaky valve or gland shall report same immediately.
- (e) Before any work is done upon electric boilers, the foreman or in his absence the shift engineer, shall be responsible for seeing that the disconnect switches are open and that "hold" cards are properly posted.

#### 39. WORKING METHODS.

- (a) Before lighting a fuel boiler, the fireman shall see that a proper draft is indicated, in order to avoid the possibility of a flareback.
- (b) When it is necessary for any man to enter or do any work inside raw coal bunkers or pulverized coal bins, around his waist he shall attach a safety rope, which shall be held in the hands of a second man outside the bunker or bin as long as the first man is inside.



**39. WORKING METHODS (continued)**

- (c) In moving loaded coal cars from grade to the hopper position, the man on the brake shall make certain that every other person in the vicinity is clear of the track before releasing the brake.

**40. WORKING ON BOILERS.**

- (a) A boiler shall not be entered without first making certain that all valves are shut and are without leaks.
- (b) Extension cords used inside boiler drums shall be of approved quality and in first class condition.

**41. SAFETY EQUIPMENT.**

- (a) The dust masks provided shall be used whenever the occasion properly requires their use.





## SECTION H

### CENTRAL STEAM HEATING DISTRIBUTION

#### 42. WORKING METHODS.

- (a) Before turning steam on any line, make sure that there are no live steam outlets unwatched or uncontrolled, that the line is properly drained, and that traps are in good working order.
- (b) Always turn steam on gradually thereby allowing pipes to heat up and expand before turning on fully.
- (c) Before leaving any steam line, after turning on steam, check over all return lines, traps, strainers and meters and make sure all are working properly.
- (d) Necessary tools and equipment are provided by the Hydro, but it is the duty of each employee to see that they are kept in proper repair and to immediately report to the office any damaged or faulty equipment.

#### 43. STREET PATROLS.

- (a) Patrols must use the danger flags or barricades provided and see that they are properly displayed or erected before starting work at any point.
- (b) Any barricades or apparatus left out overnight in any location normally accessible to pedestrians or other traffic must be properly illuminated with warning lights.
- (c) Manholes must be examined for gas before entering. Any sign of gas leakage in manholes or conduits must be reported immediately to the office.
- (d) When working in any manhole in traffic or in which working conditions are difficult, there must be a man on the surface to act as watchman and to give aid in case of emergency.



#### 44. CUSTOMER'S PREMISES.

- (a) Before steam is turned on to distribution mains, service valves on customer's premises must all be closed and locked, and opened only by some employee of the Steam Heating Division.
- (b) Service valves must be closed and locked before any boiler valves are unsealed and opened and similarly all boiler valves must be closed and sealed before a service valve is opened.
- (c) Flashlights are provided for use in dark places, but if an extension light is required, the apparatus must be of approved quality and in proper order. Matches or exposed lights of any kind shall never be used.
- (d) Any customer found infringing regulations, disregarding sealing of valves or making alterations without first informing the department must be immediately reported to the office.



## SECTION J

### GARAGE DEPARTMENT

#### 45. AT GARAGE.

- (a) Before filling the gas tank, the ignition and lights are to be turned off. Smoking is prohibited near the vehicle while the tank is being filled.
- (b) The nozzle of the gas hose shall first be grounded on an exposed metal part of the car such as the bumper, in order to discharge all static. While the tank is being filled, the nozzle of the hose should be kept in contact with the side of the filler opening.
- (c) If a gasoline fire should start, carbon tetrachloride (Pyrene), foam, or dry chemicals should be applied to the base of the blaze. In the absence of the above, dry dirt, sand or ashes can be used.
- (d) Matches or other open flames must not be used to look into a radiator which contains anti-freeze solution. The fumes may ignite.
- (e) In an overheated radiator, the water is usually low and the upper part filled with steam, therefore caution should be used in removing the radiator cap.
- (f) Engines of automobiles shall not be operated in a closed garage unless proper ventilation is provided, and then never for a longer time than is necessary. A window of the car shall be kept at least slightly open when the motor is running.

#### 46. INSPECTION.

- (a) Before leaving the garage the driver shall check the condition of the tires, rear view mirror, horn, lights and windshield wiper. On leaving the garage, brakes and steering gear shall be tested. If the above are in any way found defective, the driver shall immediately report the condition to the foreman or superintendent.



## 47. LOADING.

- (a) Brakes shall be properly applied by setting the emergency, or the wheels blocked, when loading or unloading.
- (b) Objects shall be confined within the truck if possible, but when projecting more than four feet in the front or rear, shall be marked with a red flag in the daytime and with approved red lights at night.

## 48. DRIVING.

- (a) Drivers shall be familiar with, and shall drive in accordance with all provincial and local traffic regulations.
- (b) Cars shall be kept under such control that they can be stopped safely under all traffic conditions.
- (c) No person shall be allowed to ride in trucks, except employees on duty.
- (d) Riding on trailers; on the tops, running-boards and fenders; getting on or off vehicles when in motion, are all forbidden.
- (e) When making a turn or entering a main thoroughfare with a trailing load of poles or other long material, a man shall ride in the rear of the truck as a lookout and shall signal following traffic. The driver shall receive an "all clear" signal from the lookout before proceeding.
- (f) While the niggerhead, power takeup, or winch is being used, the truck driver shall always be at the controls. When pulling wire or lifting loads, the truck driver shall operate winch of truck only when signal is given.
- (g) To back a vehicle safely is entirely the responsibility of the driver. On trucks where the rear vision is obscured, he should receive the "all clear" signal from a man in the rear before proceeding.





## 49. PARKING.

- (a) When parking on an incline, cramp wheels against the curb or block wheels.
- (b) The foreman in charge of a line truck shall arrange his work so as to keep his truck working from the right side of the road whenever possible.
- (c) When work requires that a truck be parked on the travelled portion of the highway or when the view of approaching traffic is obscured, flags, signs, or a watchman shall be provided.
- (d) When leaving a parking space or pulling into a line of traffic use extreme care, and always signal your intentions.
- (e) Never enter or leave the left side of a car when on a street or highway, unless it is certain that there is no traffic approaching from either direction.



## SECTION K

### TRAMWAY DEPARTMENT.

#### 50. TRAIN OPERATION.

- (a) Every employee is required to exercise the utmost caution to avoid injury to himself or to others, and especially in switching or other movements of trains.
- (b) The following are prohibited:
  - (1) Entering between, or being in front of engine, car or cars in motion, for any purpose whatsoever, except where engine or car is far enough away to clearly permit employee to get out of danger before engine or car reaches him.
  - (2) Attempting to board a moving engine or car from a position in front, whether it is proceeding forward or backward.
  - (3) Entering between cars when in motion and using either hand or foot to adjust drawbars or knuckles, to raise locking blocks, to use the operating lever, to turn angle cocks or to uncouple air hose.
  - (4) Riding or being between engine and cars, or between cars when same are moving, except where necessary in switching or train movements.
  - (5) Being on sides of cars in vicinity of any loading platform.
  - (6) Switching cars at loading or unloading points before it is positively known that all men, teams and trucks are clear.
  - (7) Kicking cars into tracks where cars are being loaded or unloaded or where there are boarding cars.



**50. TRAIN OPERATION (continued)****(b) The following are prohibited:**

- (8) Moving a locomotive on engine-house tracks without first making sure there is no person working around or under the engine, and without ringing the bell.
- (9) Shoving over draw bars with foot in order to ensure coupling.

**51. GAS AND HAND VEHICLES.**

- (a) Gas driven and hand cars must not be operated without proper authority.
- (b) Gas driven cars must not be operated at a greater speed than that which is thoroughly safe as regards switches, crossings, track conditions, curves and visibility.
- (c) Immediately after starting a gas driven car the brakes shall be tested to ensure that they are operating properly.
- (d) Car barn doors must be opened before starting up any gas driven vehicle.



## RESUSCITATION FROM ELECTRICAL SHOCK (Schafer's Prone Pressure Method)

Waste no time in loosening or removing clothing.

Lay the patient in a prone position (i.e., back upwards) with the head turned to one side, so as to keep his nose and mouth away from the ground. No pad is to be placed under the patient, nor need the tongue be drawn out, as it will fall naturally towards the lips.

Kneel at one side or across the patient, facing his head, and place your hands over the lower ribs, the thumbs nearly parallel and close to the spine, the fingers slightly open and pointing towards the shoulders. Keeping your arms quite straight and rigid and leaning your body forward slowly apply firm but not violent pressure straight downwards upon the lower part of the chest, thus driving air out and producing expiration. Draw back your body somewhat more rapidly and relax the pressure, but do not remove your hands; this produces inspiration.

Alternate these movements by a rhythmic swaying backwards and forwards of your body, twelve to fifteen times a minute, persevering until respiration is restored, or until rigor mortis (stiffening of the body) has set in.

To carry on artificial respiration the services of several persons are often required to relieve one another by turns. Efforts must be kept up for at least an hour and a half, as many persons apparently lifeless have been revived after long-continued artificial respiration.

When breathing is restored promote warmth and circulation by covering with dry warm clothing and rubbing body and limbs energetically towards the heart. Afterwards, when patient is able to swallow, give hot drinks—tea, coffee or milk.

Watch the patient carefully for some time to see that breathing does not fail; if it does, at once begin artificial respiration again.





## FIRST AID INSTRUCTIONS

### ACID BURNS:

- (1) Flush burned parts freely with water and apply a solution of soda immediately.
- (2) Cover burned surface with Tannafax (tannic acid jelly) and apply gauze and a bandage.

### ALKALINE BURNS:

- (1) Flush burned parts freely with water and apply a 1 to 5 solution of vinegar and water for several minutes.
- (2) Cover burned surface with Tannafax and apply gauze and a bandage.

### ELECTRICAL OR HEAT BURNS:

- (1) Cover burned surface with Tannafax and apply gauze and a bandage.

### CONVULSIONS (FITS):

- (1) Loosen clothing.
- (2) Place piece of wood or cork between teeth to prevent tongue being bitten.
- (3) Carefully guide the patient's struggles, so as to prevent injury to himself.
- (4) Do not give stimulants.
- (5) Call a doctor immediately.

### CUTS, WOUNDS, ETC.:

- (1) Apply iodine directly to wound and surrounding surface.
- (2) Cover wound with proper size sterile compress, holding it in place with bandage already attached.

### DISLOCATIONS:

- (1) Do not attempt to put bone back in place.
- (2) Hold limb in most comfortable position, using splint and bandage.
- (3) Get patient to doctor as soon as possible.



## **DROWNING:**

Use prone pressure method of artificial respiration.

## **ELECTRIC SHOCK:**

Use prone pressure method of artificial respiration.

## **EYE INJURIES:**

### **Acid Burn:**

- (a) Flush eye with water.
- (b) Wash out eye with solution of bicarbonate of soda.

### **For Alkaline Burns:**

- (a) Flush eye with water.
- (b) Wash out eye with solution of boric acid.

Note: Do not attempt to remove any foreign substances imbedded in eye. See a doctor as soon as possible.

## **POISONING:**

- (1) Lay patient flat on stomach, head turned to one side.
- (2) Loosen clothing.
- (3) If breathing, break ammonia inhalant under nose, as directed on package.

## **UNCONSCIOUS FROM ANY CAUSE:**

- (1) If not breathing, apply prone pressure method of artificial respiration. Use ammonia inhalant as soon as breathing starts.
- (2) After patient is breathing and conscious, 1 teaspoonful of aromatic spirits of ammonia in a glass of water may be given as a stimulant.

Note: Call doctor as soon as possible.



## FRACTURES:

- (1) Cut away clothing from fracture; do not drag it off.
- (2) Handle limb with utmost gentleness.
- (3) Fold wire splint so that it is sufficiently long to project beyond the joints at the end of the broken bone.
- (4) Pad splint with gauze compress and apply with compress to flesh.
- (5) Hold splint in place with 4-inch bandage, so that limb cannot move.

## FROST BITE:

- (1) Do not apply heat to frozen part. Do not apply first aid in warm room.
- (2) Bring back to natural temperature by rubbing with snow or cold water.

## HEMORRHAGE (CUT ARTERIES):

- (1) Elevate injured part and keep patient quiet.
- (2) Apply tourniquet between heart and wound.  
Note: Release pressure on tourniquet at least once every 15 minutes until blood again flows from wound.

## LARGE GAPING WOUNDS:

- (1) If impossible to reach a doctor, sterilize wound with iodine, as instructed under "Cuts, Wounds, etc.," and draw edges of wound together.

## NOSE BLEEDING:

- (1) Do not allow patient to lie down.
- (2) Elevate arms.
- (3) Breathing should be through mouth.  
Note: Do not allow patient to blow his nose.



### SPLINTERS OR FOREIGN SUBSTANCE IN BODY:

- (1) Use forceps to remove substance if end projects above flesh.

Note: Under no conditions attempt to "dig it out."

### GRAIN OR INJURIES WHICH DO NOT BLEED:

- (1) Use 4-inch compress, placing pad over injury.
- (2) Bandage tightly, but use care not to stop circulation.
- (3) Elevate the injured part and keep it free from all motion.

### SUFFOCATIONS:

Use prone pressure method of artificial respiration.



















